On the Complex Formation of Np^{4+} and NpO_2^+ With   SOV/20-124-4-24/67

Trilon B in Aqueous Solutions

The authors suppose, however, that the latter complex predominates. In this connection, they point to a very considerable stability and a similar complex formation of other elements with Trilon. Its $K = (5.7 \pm 3.47) \cdot 10^7$. Complex formation of NpO_2^+. In the first series of experiments NpO_2^+ was titrated with Trilon solution according to the spectrophotometric method ($\mu = 1$). From the titration curves only the formation of one single complex NpO_2^+ with γ^{4-} may be assumed. The stability constants could be calculated only for the complex $\left[NpO_2 \, \gamma \right]^{3-}$ ($K = (3.73 \pm 1.79) \cdot 10^9$). In the second series of experiments the dependence of complex formation on pH was investigated on a large excess of Trilon (Fig 3). Apparently, it ends at pH 4.5 since later on no spectral changes were observed up to pH 10. Therefore, it may be assumed that within this range only one complex is produced. For pH 3.2 - 4.5

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SOV/20-124-4-24/67

On the Complex Formation of Np^{4+} and NpO_2^+ With Trilon B in Aqueous Solutions

PRESENTED: July 8, 1958, by V. I. Spitsyn, Academician

SUBMITTED: July 2, 1958

Card 5/5

On the Complex Formation of Np^{4+} and NpO_2^+ With
Trilon B in Aqueous Solutions

SOV/20-124-4-24/67

the K value for $[NpO_2 H]^{3-}$ was calculated which differs from that determined by titration. In the third series of experiments the authors studied the complex formation in dependence of pH for a solution with equimolar Np (V)-and Trilon content. As may be seen from figure 3, already the entire amount of Trilon is bound at pH 6.3. A duplication of the Trilon quantity leads to an increase of E (from 225-226 to 235) without considerable variation of the maximum position (by 5 mμ).

Although the formation of $[(NpO_2)_2 H]^{2-}$ could not be proved by the spectrophotometric method, its presence is evidently confirmed by a high degree of stability of the constant calculated for it between pH 3.25 and 4.4 (Table 3). There are 3 figures, 3 tables, and 6 references, 3 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

Card 4/5

GEL'MAN, A. D.,

"The Character of Chemical Bonds Between the Central Atom and Non-Saturated Molecules in the ComplexCompounds," report to be submitted for Int'l Conf on Coordination Chemistry, IUPAC, London, England, 6-11 Apr 59.

Institute of Physical Chemistry, Moscow.

ARTYUKHIN, P.I.;MEDVODOVSKIY, V.I.; GEL'MAN, A.D.

Effect of the α-radiation of plutonium on its valence state in
nitric acid solutions. Radiokhimiia 1 no.2:131-135 '59.
(MIRA 12:8)

(Plutonium) (Alpha rays)

DRABKINA, L.Ye.; GEL'MAN, A.D.

Investigation of the stability of hexavalent plutonium in some
aqueous solutions. Radiokhimiia 1 no.2:136-140 '59.
(MIRA 12:8)

1. Institut fisicheskoy khimii AN SSSR.
        (Plutonium) (Solution (Chemistry))

MOSKVIN, A.I.; KHALTURIN, G.V.; GEL'MAN, A.D.

Investigation of the complex formation of trivalent americium
in oxalate and ethylenediaminetetraacetic acid solutions by
means of ion exchange. Radiokhimiia 1 no.2:141-146 '59.
(MIRA 12:8)

(Americium compounds)

MEFOD'YEVA, M.P.; ARTYUKHIN, P.I.; GEL'MAN, A.D.

Spectrophotometric study of complex formation by the neptunyl
and acetate ions. Radiokhimiia 1 no.3:309-316 '59.
(MIRA 12:10)

(Neptunyl compounds) (Complex compounds)
(Acetates)

5(4), 21(1)
AUTHORS:

SOV/78-4-6-18/44

Artyukhin, P. I., Medvedovskiy, V. I., Gel'man, A. D.

TITLE: The Separation of Pu(IV) and Pu(V) ir. Nitric Acid Solution
             (Disproportsionirovaniye Pu(IV) i Pu(V) v rastvorakh azotnoy
             kisloty)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 6, pp 1324-1331
             (USSR)

ABSTRACT: The reaction for the separation of Pu(IV) and Pu(V) was in-
             vestigated in different nitric acid concentrations. Pu(IV)-
             solutions were produced with 0, 10, 0.20, 0.30 and 0.40 n
             HNO_3. The experimental results are given in the figures 1-4.
             The equilibrium constants and the constants of the rate of
             separation were computed and are given in table 1. The ions
             Pu^{4+} and the complex ions $Pu(NO_3)^{3+}$ take part in the separation
             reaction of Pu(IV). The results of the separation process
             Pu(V) in nitric acid solutions are given in the figures 7-9.
             It was found that the rate of separation rises with the in
             crease of the hydrogen ion concentration. The separation of
Card 1/2   Pu(V) proceeds first according to the reaction

SOV/78-4-6-18/44

The Separation of Pu(IV) and Pu(V) in Nitric Acid Solution

$$Pu(V) + Pu(V) \underset{K_6}{\overset{K_5}{\rightleftharpoons}} Pu(IV) + Pu(VI)$$ (16). The Pu(IV) produced
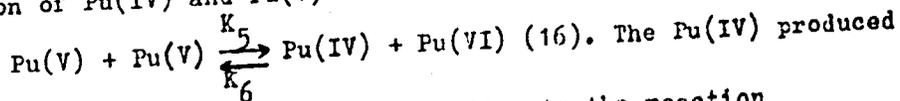
reacts easily with Pu(V) according to the reaction

$$Pu(IV) + Pu(V) \underset{K_4}{\overset{K_3}{\rightleftharpoons}} Pu(III) + Pu(VI).$$ The separation reaction
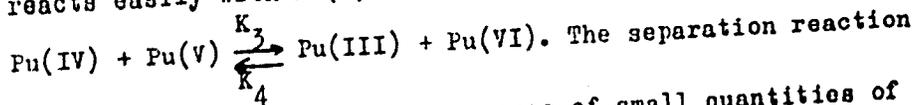
proceeds in the case of the presence of small quantities of
Pu(III) according to the equation $$Pu(III) + Pu(V) \underset{K_1}{\overset{K_2}{\rightleftharpoons}} 2Pu(IV).$$
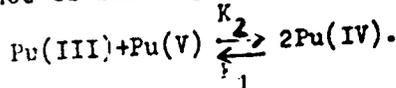
The rate of separation is given in figure 11. The constants
of the rate of separation are given in table 2. There are
11 figures, 2 tables, and 4 references.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk.SSSR (Institute of
Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: May 28, 1958

Card 2/2

SOV/78-4-7-12/44

5(2)
AUTHORS: Babushkin, A. A., Gribov, L. A., Gel'man, A. D.

TITLE: On the Character of the Bond Between Central Atom and Olefine in Complex Compounds of Platinum (O kharaktere svyazi mezhdu tsentral'nym atomom i olefinom v kompleksnykh soyedineniyakh platiny)

ABSTRACT: The present paper analyzes the infrared spectra of compounds of platinum with ethylene and propylene. Table 1 gives the frequencies for $K[C_2H_4PtCl_3] \cdot H_2O$ and $K[C_3H_6PtCl_3] \cdot H_2O$. It is concluded from the spectra that in both compounds the carbon double bond is ruptured and a triple ring is formed in ethylene

$\begin{array}{c} H_2C \\ | \\ H_2C \end{array} PtCl_3$. This is confirmed by a comparison with the spectra
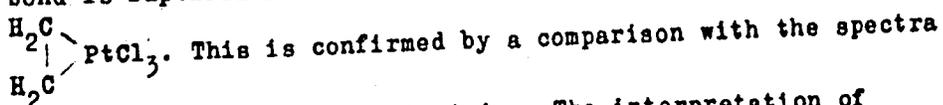
of ethylene oxide and ethylenimine. The interpretation of frequency within the range of 1500 cm^{-1} as a valence shrinkage of the C=C-bond, as given by J. Chatt and L. A. Duncanson (Ref 9), is therefore considered to be improbable. Figure 1

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SOV/78-4-7-12/44

On the Character of the Bond Between Central Atom and Olefine in Complex Compounds of Platinum

shows the infrared absorption spectrum of propylene and of the propylene-platinum compound. There are 1 figure, 1 table, and 24 references, 12 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: March 25, 1958

Card 2/2

KONDRATOV, P.I.; GEL'MAN, A.D.

Oxalate compounds of tetravalent neptunium.   Radiokhimiia 2 no.3:315-
319 '60.   (MIRA 13:10)
                        (Neptunium compounds)

65932 69532

S/078/60/005/05/05/037
B004/BC16

5.2200 (A)

AUTHORS: Sokhina, L. P., Gel'man, A. D.

TITLE: Decomposition of Complex Oxalate Compounds of Plutonium
Under the Action of Alpha Radiation

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 5,
pp. 1013-1015

TEXT: The authors found that the oxalate complexes of plutonium change
their color on storage. They explain this phenomenon by the action of α-
radiation of Pu upon $C_2O_4^{2-}$, and investigated the following compounds in ord..
to clarify this effect: $Pu(C_2O_4)_2 \cdot 6H_2O$ (two modifications),
$Na_4\left[Pu(C_2O_4)_4\right] \cdot 5H_2O$ (two modifications), $K_4\left[Pu(C_2O_4)_4\right] \cdot 4H_2O$ (two modifi-
cations), and $(NH_4)_6\left[Pu(C_2O_4)_5\right] \cdot nH_2O$. These compounds were analyzed after
3, 5, and 10 days, 4 months, and 1 year (Table 1). Weight constancy occurred
after 1 1/2 year (analyses in Table 2). Under the action of α-radiation

Card 1/2

_66022_ _69532_

Decomposition of Complex Oxalate Compounds of   S/078/60/005/05/05/037
Plutonium Under the Action of Alpha Radiation   B004/B016

$C_2O_4^{2-}$ decomposes in the cold to give CO and CO_3^{2-}. Pu(IV) is reduced to
Pu(III) by CO. Only after complete disintegration of $C_2O_4^{2-}$ Pu(III) is
oxidized again to Pu(IV). The end product of the decomposition of the
ammonium compound and plutonium oxalate is the hydroxycarbonate
$PuOCO_3 \cdot 2H_2O$. The afore-mentioned sodium (or potassium) salt decomposes to
form a mixture of plutoniumoxycarbonate and sodium (or potassium) carbonate.
In 1950 the authors together with V. I. Belova measured the magnetic
susceptibility of Pu(III) and Pu(IV) oxalates and their disintegration
products. The data contained in table 3 conform to those found by A. D.
Gel'man and F. P. Kondrashova for plutonium peroxide. There are 3 tables
and 3 Soviet references.

SUBMITTED: February 16, 1959

Card 2/2

S/186/62/004/002/004/010
E075/E136

AUTHORS: Gel'man, A.D., Moskvin, A.I., and Zaytseva, V.P.

TITLE: On the carbonate compounds of plutonium

PERIODICAL: Radiokhimiya, v.4, no.2, 1962, 154-162

TEXT: The object of the work was to determine the
composition and stability of Pu(VI) complexes forming in
carbonate solutions by determining the relationship between MoO_2^{2+}
and the addend. To confirm the reactions taking place in
the solutions some of the carbonate complexes of Pu were
separated in the solid state. The equilibrium concentration of
Pu in the solutions was determined by a radiometric method and
pH values were measured by a potentiometer type ЛП-5 (LP-5)
with a glass electrode. Solubility of ammonium diplutonate in
$(NH_4)_2CO_3$ solutions was determined and found to increase with the
carbonate concentration. Dissociation constants were calculated
for the first time for the following complexes:

$[PuO_2(CO_3)(OH)_2 \cdot 2H_2O]^{2-}$, $[PuO_2(CO_3)(OH) \cdot 3H_2O]^-$, and

Card 1/2

On the carbonate compounds of ...   S/186/62/004/002/004/010
E075/E136

$[PuO_2(CO_3)_2 \cdot 2H_2O]^{2-}$. Dissociation constants and solubility products of PuO_2CO_3 were also determined. The authors isolated for the first time a compound $NH_4[PuO_2(CO_3)(OH) \cdot 3H_2O]$ from dark red carbonate solutions. Carbonate complexes with a ratio of MO_2^{2+} to addend equal to 1:2 and 1:3 were also isolated. The solubility of plutonyltricarbonate in $(NH_4)_2CO_3$ solutions of various concentrations was determined and the absorption spectra of the green solutions thus obtained were measured. It was calculated that under these conditions a carbonate complex with a ratio of MO_2^{2+} to addend equal to 1:2 forms predominantly.

There are 2 figures and 4 tables.

SUBMITTED: March 1, 1961

Card 2/2

21.4200

AUTHORS: Kondratov, P.I., Gel'man, A. D.

TITLE: Neptunium Phenylarsonates (IV) and (VI)

PERIODICAL: Radiokhimiya, v. 2, no. 6, 1960, 659 - 662

TEXT: The conditions of a quantitative precipitation of neptunium phenylarsonates (IV) and (VI) were established. The solubility products of the latter were computed, which are equal to: $SP_{NpR_2} = (2.7 \pm 2.5) \cdot 10^{-30}$, and

$SP_{NpO_2R} = (1 \pm 0.2) \cdot 10^{-14}$, respectively. The method of solubility was used to study the interaction of tetra-, penta- and hexa-valent neptunium with phenylarsonic acid. The solubility of the (IV) and (VI) neptunium phenylarsonates was studied, depending on the acidity of the solution and the concentration of the precipitating agent. Figures 1 - 3 are graphs showing the experimental results in curves of the relation: $\lg S$ versus $\lg[H^+]$, $\lg S$ versus $\lg[H_2R]$, where S is the solubility, H_2R the conditional symbol of the phenylarsonic acid. The conditions

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24083

S/186/60/002/006/004/C26
A051/A129

Neptunium phenylarsonates (IV) and (VI)

of the quantitative precipitation are found by determining the equilibrium constant of the reaction:

$$Np^{4+} + 2H_2R \longrightarrow Np(R)_2\downarrow + 4H^+ \tag{1}$$

$$K_p = \frac{[N_pR_2] \cdot [H^+]^4}{[Np^{4+}] \cdot [H_2R]^2} \qquad \text{or} \qquad [Np^{4+}] = \frac{[H^+]^4 \cdot [NpR_2]}{[H_2R]^2 \cdot K_p} \ .$$

Taking the logarithm of this expression, the following equation is derived:

$$\lg [Np^{4+}] = 4 \lg [H^+] - 2 \lg [H_2R] - \lg K, \quad \text{where } K = \frac{Kp}{[NpR_2]} , [NpR_2] = \text{const.}$$

Assuming that under conditions of precipitation the solubility is determined by the Np^{4+} ions, then $\lg S = [Np^{4+}] = 4 \lg [H^+] - 2 \lg [H_2R] - \lg K$. If the precipitation is carried out at constant $[H_2R]$, then:

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24083

Neptunium phenylarsonates (IV) and (VI)

S/186/60/002/00/004/026
AC51/A129

$$\lg S = \frac{1}{K \cdot [H_2R]^2} + 4 \lg [H^+].$$

(L)

The latter expression is said to represent the relationship of S to the acidity of the solution. Figures 1 - 3 show that the solubility of neptunium phenylar-sonate (IV) increases proportionally to the fourth degree of the hydrogen ion concentration and decreases proportionally to the second degree of the concentration of the precipitating agent. This confirms the validity of equation (1) under these conditions. Extrapolating the tangents (in Figure   ) to

$$[H^+] = 1, \quad \lg S_0' = \lg \frac{1}{K \cdot [H_2R]^2},$$

from which, knowing the value of $[H_2R]$, K is easily determined. $\lg S_0'' = \lg \frac{[H^+]^4}{K}$
is determined in a similar way from Figure 3. The average value of K found from Figures 1, 2, 3 is equal to:

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Neptunium phenylarsonates (IV) and (VI)

$(1.2 \pm 1) \cdot 10^6 = \dfrac{[H^+]^4}{[H_2R]^2[Np^{4+}]}$. The expression obtained is used to calculate

the solubility of neptunium at a given acidity and concentration of the precipitating agent.

$$SP = [Np^{4+}][R^{2-}]^2 = \frac{[R^{2-}]^2[H^+]^4}{K \cdot [H_2R]^2} = \frac{K_d^2}{K} = (2.7 \pm 2.5) \cdot 10^{-30},$$

where K_d is the dissociation constant of the phenylarsonic acid equal to $1 \cdot 10^{-12}$ (Ref. 4: D. Pressman, D. H. Brand, J. Am. Chem. Soc., 65, 4, 540, 1943; Ref. 5: V. N. Portnov, ZhOKh, 18, 4, 594, 1948). The conditions of the quantitative precipitation of neptunium are determined from the reaction

$$NpO_2^{2+} + H_2R \longrightarrow NpO_2R\downarrow + 2H^+,$$
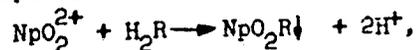
which in turn is determined from the equilibrium constant K.

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Neptunium phenylarsonates (IV) and (VI)

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S/186/60/002/006/004/026
A051/A129

$$K = \frac{[H^+]^2}{[NpO_2^{2+}][H_2R]} = 99 \pm 16.$$ The value of K is said bo be connected with the

solubility product of the neptunium phenylarsonate:

$$SP = [NpO_2^{2+}][R^{2-}] = \frac{[H^+]^2[R^{2-}]}{K \cdot [H_2R]} = \frac{K_d}{K}, \text{ thus, } SP = (1 \pm 0.2) \cdot 10^{-14}.$$

There are 3 figures, 1 table and 5 references: 3 Soviet-bloc and 2 non-Soviet-
-bloc. The references to the English language publications read as follows:
A. Voigt, N. Sleirht, R. Hein, S. Wreight, The transuranium elements, 14B,
15, 9, N. Y., 1949; D. Pressman, D. H. Brand, J. Am. Chem. Soc., 65, 4, 540,
1943.

SUBMITTED: January 15, 1960.

Card 5/ 7

AUTHORS: Gribov, L. A., Gel'man, A. D., Zakharova, F. A., Orlova, M. M.

S/078/60/005/04/039/040
B004/B016

TITLE: Investigation of Some Complex Compounds of Platinum by the Method of Infrared Spectroscopy

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 4, pp 987 - 989 (USSR)

ABSTRACT: The authors investigated the infrared spectra of the compounds cis- and trans-$[CONH_3Cl_2Pt]$ in crystal form in paraffin oil emulsion in the range 2500 - 1600 cm^{-1} and 700 - 450 cm^{-1} by means of the IKS-11-spectrometer. The absorption bands are given which correspond to the group OCPt. To explain the resultant spectra, the oscillations of the plane model of the trans--$[CONH_3Cl_2Pt]$ are mathematically analysed by assuming a linear addition of the CO molecules to platinum. Calculations confirm the linear addition of CO to Pt in contradiction with opinions held by M. Ye. Dyatkina (Ref 12). Furthermore, the infrared spectra of the compounds $[(CH_3)_3(NH_3)_3Pt]J$ and $[(CH_3)_3PtJ]$ were taken by means of the IKS-14-spectrophotometer. The results are summarized in a table along with preliminary interpretations of

Card 1/2

PHASE I BOOK EXPLOITATION   SOV/5301

Gel'man, Anna Dmitriyevna, Doctor of Chemical Sciences; Apollinariy Ivanovich Moskvin, Candidate of Chemical Sciences; Lev Mikhaylovich Zaytsev, Candidate of Chemical Sciences; and Mayya Pavlovna Mefod'yeva, Candidate of Chemical Sciences

Kompleksnyye soyedineniya transuranovykh elementov (Complex Compounds of Transuranium Elements) Moscow, Izd-vo AN SSSR, 1961. Errata slip inserted. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fizicheskoy khimii.
  Ed. of Publishing House: E.S. Dragunov; Tech. Ed.: P.S. Kashina.

PURPOSE: This book is intended for chemists interested in the complex compounds of transuranium elements, and specifically for young scientific workers and aspirants doing research in this field.

COVERAGE: The book deals with the complex compounds of transuranium elements. It describes the formation of complex compounds of neptunium (including oxalates, carbonates, acetates, and fluorides), and plutonium in aqueous solutions. Types of such solutions are described along with the hydrolysis

Card 1/6

Complex Compounds of Transuranium Elements   SOV/5301

of hydrated plutonium ions of various oxidation states. Physicochemical
properties of plutonium compounds in aqueous solutions are examined along
with the plutonium oxalates, phosphates of Pu (IV) and Pu (VI), and acetates
of Pu (VI). The synthesis and properties of complex compounds of tri-,
tetra-, and hexavalent plutonium are described along with the insoluble
plutonium compounds such as the plutonium oxalates, hydroxides, peroxides,
and dioxides. The formation of americium, curium, oerkelium, californium,
einsteinium, fermium, and mendelevium complexes are also covered. The use
of complex compounds for the separation of transuranium elements is discussed
along with prevailing methods such as coprecipitation, extraction, ion exchange,
and fractional distillation. The authors thank Candidates of Chemical Sciences
P.I. Artyukhin and L. Ye. Drabkin. There are 108 references: 54 English,
46 Soviet, 4 Swedish, 2 German, and 2 French.

TABLE OF CONTENTS:

Card 2/6

GRIBOV, L.A.; GEL'MAN, A.D.

Infrared spectroscopy in the study of the structure of some complex compounds; Zhur.strukt.khim. 2 no.5:569-572 S-O '61.
(MIRA 14:11)

1. Institut fizicheskoy khimii AN SSSR.
(Complex compounds--Spectra)

GEL'MAN, A.D.; MEFOD'YEVA, M.P.; PIKAYEV, A.K.; GLAZUNOV, P. Ya.

Effect of ionizing radiation on the valence states of neptunium
in aqueous solutions. Radiokhimiia 3 no.1:31-36 '61.   (MIRA 14:3)
(Neptunium)

$5.2500 (1273, 1350, 1043)$

21.3100

AUTHORS: Gel'man, A.D., Mefod'yeva, M.P., Pikayev, A.K., Glasunov, P.Ya.

TITLE: The effect of ionizing radiation on the valency state of neptunium in aqueous solutions

PERIODICAL: Radiokhimiya, v 3, no 1, 1961, 31-36

TEXT: A study was made of fast electrons acting upon $Np^{(VI)}$ in $HClO_4$ (0.02-3.4 n), HNO_3 (0.05 n) and H_2SO_4 (0.86 n) solutions, as well as in 0.8 n H_2SO_4. The authors investigated the radiolytic reduction of $Np^{(VI)}$ in these solutions, as well as the radiolytic oxidation of $Np^{(IV)}$ in the sulfuric acid solution. $Np^{(VI)}$ in the $HClO_4$ solution was produced by heating a solution of neptunium salt with concentrated nitric acid for 3-4 hours (Ref 2). $Np^{(IV)}$ in the H_2SO_4 solution was prepared by a two-fold reprecipitation of the hydroxide. The concentrations of neptunium in the investigated solutions was determined by spectrophotometry. Two series of measurements of self-reduction of $Np^{(VI)}$ in the solution were carried out, the concentration of which was close to that of the irradiated solutions. The relation-

Card 1/7

ship curves D_{980} to the standing time of the solutions are given in Fig 1. Fig 2 shows the difference in the accumulation of $Np^{(VI)}$ when the solution is irradiated and Fig 3 is a diagram of the apparatus used for irradiating the solutions. An electron accelerator of 1.0-1.2 Mev served as the source of ionizing radiation (Ref 3). The relationships of the quantity of $Np^{(V)}$ formed to the amount in irradiation of a 0.001 M solution of $Np^{(VI)}$ in 0.86 n H_2SO_4 (curve 1) and 0.001 M $Np^{(VI)}$ in 0.05 n HNO_3 (curve 2) are shown in Fig 4. Using the slopes of the curves 1 and 2 (Fig 4) the initial yields of $Np^{(V)}$ could be computed. $G_{NpO_2^+}$ yield equals 3.01 for 0.86 n H_2SO_4 and 8.25 ion/100 ev for 0.05 n HNO_3. When an aqueous solution of $Np^{(IV)}$ is irradiated with fast electrons, the oxidation of $Np^{(IV)}$ to $Np^{(V)}$ takes place, but not that of $Np^{(VI)}$. Curve 3 (Fig 4) shows the relationship of the quantity of $Np^{(V)}$ formed to the amount obtained when irradiating a 0.001 M solution of $Np^{(IV)}$ in 0.8 n H_2SO_4. Thus, the authors conclude that the most stable valency state of neptunium in the radiochemical sense is $Np^{(V)}$, i.e., the neptunoyl ion NpO_2^+. The authors calculated the value of $G_{NpO_2^+}$ and found it to be largely dependent on the nature of the acid used.

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It was found that the oxidation of $Np^{(IV)}$ to $Np^{(V)}$ in 0.8 n H_2SO_4 takes place as a result of the presence of OH radicals and hydrogen peroxide:

$$2H_2O + Np^{4+} + OH \longrightarrow NpO_2^+ + OH^- + 4H^+ \qquad (6)$$

$$2H_2O + Np^{4+} + H_2O_2 \longrightarrow NpO_2^+ + OH^- + OH + 4H^+ \qquad (7)$$
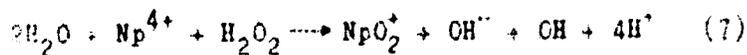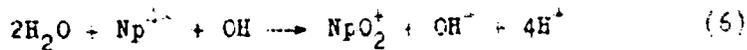
The experimental values of $G_{NpO_2^+} = 2.1$ ion/100 ev indicated that in addition to reactions (6) and (7) other processes may play a part in the radiolytic transformation of $Np^{(IV)}$, such as:

$$4H^+ + NpO_2^+ + H \longrightarrow Np^{4+} + H^+ + 2H_2O \qquad (8)$$

$$H + H \longrightarrow H_2. \qquad (9)$$

The authors assume that there is an interaction between $Np^{(VI)}$ and $Np^{(IV)}$ and the products of water radiolysis. It is possible

Card 3/7

The effect of ionizing radiation ...

$S/186/6\cdot/0\cdots/0\cdots/0\cdots$
$A051/A129$

lytic oxidation of $Np^{(IV)}$ in a sulfuric acid medium becomes more complex due
to complex-formation of $Np^{(IV)}$ with the sulfate-ion. There are 4 figures,
1 table and 13 references: 7 Soviet-bloc, 6 non-Soviet-bloc.

Table: Relationship of the reduction yield of $Np^{(VI)}$ to the
concentration of $HClO_4$

Concentration of $HClO_4$ (in n)	$G_{Np0_2^+}$ (in ions/100 ev)
0.0175	1.4
0.080	
0.126	
0.70	4.7
1.50	4.74
3.40	1.0

Card 4/7

GEL'MAN, A.D.; ESSEN, L.N.

Kinetics of substitution reactions in the inner sphere of complex molecules. Dokl.AN SSSR 138 no.5:1095-1098 Je '61.

(MIRA 14:6)

1. Institut fizicheskoy khimii Akademii nauk SSSR. Predstavleno akademikom V.I.Spitsynym.

(Chemical reaction, Rate of) (Substitution (Chemistry))

KAZANTSEV, Ye.I.; KONDRATOV, P.I.; KALINICHENKO, B.S.; GEL'MAN, A.D.

Study of the elution of neptunium from the anion exchanger AM.
Radiokhimia 4 no.1:81-84 '62.   (MIRA 15:4)
(Neptunium) (Ion exchange resins)

S/020/62/144/003/018/030
B119/B101

AUTHORS: Gel'man, A. D., Krot, N. N., and Yermolayev, N. P.

TITLE: Production and properties of complex nitrate compounds of quadrivalent uranium

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 3, 1962, 562-564

TEXT: U^{4+} nitrate complexes were produced in perchloric acid - nitric acid mixtures and hydrochloric acid - nitric acid mixtures of different concentrations. Small amounts of aromatic amines were added to stabilize the quadrivalent form of uranium. The resulting compounds were investigated by spectrophotometry and ion exchange. With HNO_3 contents up to 3 N in the initial mixture, UNO_3^{3+}, $U(NO_3)_2^{2+}$, $U(NO_3)_3^{+}$, and $U(NO_3)_4$ are mainly formed. The stability constants of the complexes increase with the ion intensity. They are 1.58, 1.48, 0.96, 0.35 with the ion intensity 2.0, and 2.29, 2.95, 2.62, 1.51 with the ion intensity 3.5, in that order. With more than 3 N HNO_3 in the initial mixture, the ion $[U(NO_3)_6]^{2-}$ is formed.

Card 1/2

Production and properties of....   S/0??/62/144/003/018/030
B119/B101

The salts which this formed with Cs^+, Rb^+, K^+, NH_4^+, Zn^{2+}, Mg^{2+}, pyridinium ion, aminopyridinium ion, quinolinium ion, and α, α' - - dipyridylium ion were isolated. The crystalline compounds are colored dark-green to green-gray. They are soluble in water and in dilute HNO_3, $[U(NO_3)_6]^{2-}$ decomposing into NO_3^- and one of the above-mentioned lower complex forms. The solubility of the salts decreases with increasing ion radius of the cation. They are insoluble in benzene, chloroform, and carbon tetrachloride. The salts of K, Mg, and Zn are soluble in diethyl ether. When stored in solid state, the salts decompose gradually owing to intramolecular oxidation of U^{4+}. There is 1 table.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

PRESENTED: January 22, 1962, by V. I. Spitsin, Academician

SUBMITTED: January 10, 1962

Card 2/2

43228

S/844/62/000/000/027/129
D244/D307

AUTHORS: Gel'man, A. D., Mefod'yeva, M. P., Pikayev, A. K. and
Glazunov, P. Ya.

TITLE: Radiolysis of aqueous solutions of tetra- and hexavalent
neptunium

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khi-
mii. Ed. by L. S. Polak. Moscow, Itd-vo AN SSSR, 1962,
167-170

TEXT: In connection with the recovery of Np from atomic reactors,
the radiolytic reduction of Np^{VI} was investigated in perchloric,
sulphuric and nitric acid solutions. Also investigated was the oxi-
dation of Np^{VI} in H_2SO_4 solutions. The radiation source was an elec-
tron accelerator, the energy of electrons being up to 1.0 - 1.3 Mev.
The dosage was about 4.5×10^{15} ev/ml.sec and the initial energy of
electrons 0.7 to 0.8 Mev. All solutions were saturated with air. In

Card 1/3

S/844/62/000/000/027/129
D244/D307

Radiolysis of aqueous ...

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of
Physical Chemistry AS USSR)

Card 3/3

GEL'MAN, A.D.; KROT, N.N.; YERMOLAYEV, N.P.

Some data on the preparation and properties of complex uranium (IV) nitrates. Zhur.neorg.khim. 7 no.9:2034-2044 S '62. (MIRA 15:9)

1. Institut fizicheskoy khimii AN SSSR.
(Uranyl nitrate)

KROT, N.N.; YERMOLAYEV, N.P.; GEL'MAN, A.D.

Behavior of ethylenediaminetetraacetic acid in acid solutions and its reaction with uranium (IV). Zhur.neorg.khim. 7 no.9:2054-2060 S '62. (MIRA 15:9)

1. Institut fizicheskoy khimii AN SSSR.
   (Acetic acid)   (Uranium compounds)

L 16986-63   EWT(m)/BDS   AFFTC/ESD-3   RM
                                S/020/63/149/005/010/018   6 1
                                                              6 0

AUTHOR: Gel'man, A. D., Essen, L. N., Zakharova, F. A., Alekseyeva, D. P.,
            ~~~~~~~~~~~~ M.

TITLE: The production of oxalate-sulfite and sulfite complex compounds
            of thorium and uranium (IV)

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149 , no. 5, 1963, 1071-1073

TEXT: The object of this investigation was to isolate and investigate previously
unknown complex compounds of thorium and uranium (IV) with oxalate and sulfite
ions. The starting materials were thorium oxalate and sodium sulfite. Thorium
oxalate at room temperature dissolved satisfactorily in concentrated solutions
of sodium sulfite, thus attesting to the formation of complex compounds. Upon
pouring the resulting solution into alcohol, the complex segregates out in the
form of a spiro-shaped mass which is transformed into a white crystalline
substance when re-treated with alcohol. Analysis established that the com-
plexes isolated are mixed oxalate-sulfite complexes and their composition can
be expressed by the general formula $Na_{2n}[Th(C_2O_4)_2 (SO_3)_n] \cdot x H_2O$. All the
complexes isolated are fine crystalline powders which appear homogeneous when
viewed under a microscope. But the refraction indexes of the crystals could
not be determined owing to their extremely small size. The investigation is
being continued.   ASSOCIATION: Institute of Physical Chemistry,   Card 1/2
                    Academy of Sciences USSR.

ACCESSION NR: AP4020056

S/0186/64/006/001/0035/0042

AUTHOR: Gal'man, A. D.; Mefod'yeva, M. P.; Kiseleva, Ye. D.; Glasunov, M. P.;
Kodochigov, P. N.; Peretrukhin, V. F.

TITLE: Precipitation of Np sup 239 from irradiated uranium by ion exchange method

SOURCE: Radiokhimiya, v. 6, no. 1, 1964, 35-42

TOPIC TAGS: precipitation, Np sup 239, irradiated uranium, ion exchange method,
uranium dioxide, gamma spectrum, beta spectrum, uranium

ABSTRACT: A method was developed for precipitating Np^{239} from uranium dioxide,
by irradiating it with neutron flux, using a solution of the target in 8M nitric
acid with hydrazine addition, sorption in the anion exchanger AB-17 and desorption
of $0.1M$ HNO_3. After a single filtration through the column with AB-17, Np^{239}
which is practically free from fragment activity is obtained. A high degree of
refinement is confirmed by study of the γ and β spectra of precipitated Np^{239}.
"The authors are very grateful to Yu. A. Zolotov from whom the Np^{239} was obtained."
Orig. art. has: 6 figures.

Card 1/2

MOSKVIN, A.I.; ZAYTSEVA, V.P.; GEL'MAN, A.D.

Study of the complex formation of trivalent plutonium with anions
of acetic, citric, and tartaric acids by means of ion exchange.
Radiokhimiia 6 no.2:214-230 '64.

(MIRA 17:6)

L 21065-65   EWP(j)/EWT(m)   AGD(f)-3/HSD(t)   RM
ACCESSION NR: AP4044882   S/0020/64/157/006/1403/1405

AUTHOR: Gel'man, A. D., Zaytseva, V. P.

TITLE: Production of certain Pu(V) compounds

SOURCE: AN SSSR. Doklady*, v. 157, no. 6, 1964, 1403-1405

TOPIC TAGS: pentavalent plutonium, stability, pentavalent plutonium complex compound, synthesis

ABSTRACT: The conditions under which Pu (V) is most stable were determined and several complex compounds of Pu(V) were synthesized. Pu(V) is most stable at pH 3.5-4.5 in concentrations of 2.5 g/l or less. In the preparation of Pu(V) by the H_2O_2 reduction of Pu(VI), the pH and consequently the stability of the product were rapidly reduced. When the pH was controlled at ~3, up to 8 g/l of Pu (V) were obtained, but since Pu (V) at such high concentrations reacted with the water radiolysis products, it had to be used immediately for subsequent syntheses. The following complexes were prepared: $NH_4PuO_2CO_3 \cdot 3H_2O$,

Card   1/2

L 21065-65
ACCESSION NR: AP4044882

$NH_4PuO_2CO_3 \cdot OH \cdot nH_2O$, $NH_4PuO_2F_2$, $NH_4PuO_2C_2O_4 \cdot 6H_2O$, $NH_4PuO_2HPO_4 \cdot 4H_2O$. $PuO_2(OH)$ was prepared by titration of the nitrate with NaOH; the solubility of the product was 0.5×10^{-9} at pH 6.8. Orig. art. has: 1 table

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry Academy of Sciences SSSR)

SUBMITTED: 19Apr64   ENCL: 00   SUB CODE: MM, GC

NR REF SOV: 003   OTHER: 006

Card 2/2

L 62112-65   S/0186/65/007/001/0049/0055

ACCESSION NR: AP5008005

AUTHOR: Gel'man, A. D.; Zaytseva, V. P.

TITLE: Preparation and some properties of pentavalent plutonium nitrate solutions

SOURCE: Radiokhimiya, v. 7, no. 1, 1965, 49-55

TOPIC TAGS: plutonium, reduction, hydrogen peroxide, spectrophotometry

ABSTRACT: The authors present initially a brief literature survey of earlier developments and indicate that the purpose of their work was to select a method and to investigate conditions for preparation of relatively concentrated solutions of pure pentavalent plutonium. Under appropriate experimental conditions $2 \cdot 10^{-2}$ M $Pu^{(V)}$ nitrate solutions were obtained by reduction of hexavalent plutonium with hydrogen peroxide. Continuous pH control was necessary because addition of hydrogen peroxide to hexavalent plutonium increases the acidity of the solution as the reduction proceeds. A calibration curve was obtained for the optical density of $Pu^{(V)}$ nitrate solutions as a function of the concentration of $Pu^{(V)}$ in solution. Spectrophotometric study of $Pu^{(V)}$ nitrate solutions in the pH 2-6 range showed

Card 1/2

L 62112-65
ACCESSION NR: AP5008005

analogous spectra thus indicating no complexation and no hydrolysis. Solutions where pH = 4-6 can be stored over long periods of time without oxidation of $Pu^{(V)}$. At pH > 3 $Pu^{(V)}$ was detected only after a month of storage. Orig. art. has: 8 figures.

ASSOCIATION: none

SUBMITTED: 06Jan64   ENCL: 00   SUB CODF: IC, GC

NO REF SOV: 004   OTHER: 013

Card 2/2

AUTHOR: Gel'man, A. D.; Zaytseva, V. P.

TITLE: Behavior of pentavalent plutonium nitrate solutions

SOURCE: Radiokhimiya, v. 7, no. 1, 1965, 56-68

TOPIC TAGS: plutonium, reduction, oxidation, hydrogen peroxide, radiolysis

ABSTRACT: The purpose of this work was to determine the cause of instability of $Pu^{(V)}$ in dilute nitric acid solutions and to determine the conditions under which these solutions are most stable. Pentavalent plutonium solutions were obtained by reduction of $Pu^{(V)}$ nitrate solutions with hydrogen peroxide at $pH = 3-4$. A pentavalent plutonium solution having $pH = 4$ and containing ~5 g/ℓ of plutonium was used as a stock solution for further preparations. It was found that in the pH 2-6 range disproportionation of $Pu^{(V)}$ is not a major factor in determining the stability of $Pu^{(V)}$, while oxidation and reduction by radiolysis products is quite significant. The instability of $Pu^{(V)}$ solutions due to oxidation and reduction by the radiolysis

Card 1/2

L 44282-65

ACCESSION NR: AP5008006

products of water can explain the increase of the stability of Pu$^{(V)}$ solutions as its concentration in the solution decreases; lowering the plutonium concentration in the solution decreases the concentration of the radiolysis products and also decreases the rates of reduction, oxidation and disproportionation reactions. Pentavalent plutonium solutions may be stabilized by lowering the temperature, taking up the radiolysis products and by storage of Pu$^{(V)}$ in the form of its compounds. "The authors wish to express their gratitude to L. I. Barsova for her help in the consideration of the radiolysis of the solutions." Orig. art. has: 7 figures and 4 tables.

ASSOCIATION: none

SUB CODE: IC, GC

SUBMITTED: 06Jan64   ENCL: 00

OTHER: 009

NO REF SOV: 012

Card 2/2

GEL'MAN, A. N.

DERBANDIKER, M.I., kandidat meditsinskikh nauk; GEL'MAN, A.N., ordinator

Plasma transfusion therapy of herpetiform dermatosis. Vest. ven. i
derm. no.3:52-53 My-Je '54.   (MLRA 7:8)

1. Is kafedry TsIU na baze Moskovskoy bol'nitsy im Korolenko.
   (SKIN--DISEASES)   (BLOOD PLASMA)

?

FEL'MAN, A.N.

DERBANDIKER, M.O., kandidat meditsinskikh nauk; BAZULINA, T.N., ordinator; GEL'MAN, A.N., ordinator; SMITRIYEV, S.N., ordinator; RABINOVICH, T.N., ordinator; KUNDEL', L.M., ordinator

Therapy of psoriasis in the balneological department of the Korolenko Clinical hospital. Vest. ven. i derm. no.1:18-19 Ja-F '55.   (MIRA 8:4)

1. Iz kozhnogo otdeleniya (zav.-K.A.Shmelev, konsul'tant - prof. A.I.Kartamyshev) Moskovskoy klinicheskoy kozno-venerologicheskoy bol'nitsy im. Korolenko (glav. vrach - zaslushennyy vrach RSFSR V.P.Nikolayev).
        (PSORIASIS, therapy
            balneother., results in Russia)
        (BALNEOLOGY
            balneother. of psoriasis, results in Russia)

24(5)   SOV/56-37-2-22/56

AUTHOR: Gel'man, A. P.

TITLE: On the Relativistic Momentum and Angular Momentum Operators

PERIODICAL: Zhurnal eksperimental'noy i teareticheskoy fiziki, 1959,
               Vol 37, Nr 2(8), pp 477-481 (USSR)

ABSTRACT: In this paper the correct expression for the operator of
               covariant differentiation and for the momentum and angular
               momentum operators shall be derived by an elementary, but
               systematic application of the spinor theory. The first sec-
               tion is concerned with the covariant derivative of a spinor
               limited to an orthogonal frame composed of unit vectors in
               which the components of the vectors and bivectors are real.
               The covariant derivative of the spinor $D_k \xi$ is determined ac-
               cording to Cartan's method. Exposing the course of the cal-
               culations step by step, the expression for the covariant
               derivative of the spinor ξ_i, the expression

               $$D_i \xi = \frac{1}{\sqrt{g_i}} \frac{\partial \xi}{\partial x^i} + \frac{1}{4g_i} \sum_{k \neq i} \frac{e_k}{\sqrt{g_k}} \frac{\partial g_i}{\partial x^k} H_i H_k \xi \quad \text{is derived. The}$$

               operator D_i is non-diagonal and refuses any attempt at trans-
               formation to a diagonal form. In the second section the inter-
               relation of the covariant derivative with the Dirac equation

Card 1/3

SOV/56-37-2-22/56

On the Relativistic Momentum and Angular Momentum Operators

is discussed. The expression $P_k \rightarrow -i\hbar D_k$ can be coordinated to the canonical momentum P_k. If correct results are also obtained when a momentum operator with a non-covariant index is used, this may be explained by the particular properties of the Dirac equation. This circumstance is discussed at length. In the final section the angular momentum operator is calculated. The components of this operator are defined by the equations $K_1 = -i\hbar (R_2 D_3 - R_3 D_2)$, R_k denoting the covariant Galilei component of the radius vector. The complete (three-dimensional) angular momentum operator has the form $K = K_1 H_1 + K_2 H_2 + K_3 H_3$. This operator is then also given in spherical coordinates. There is, however, still a third possibility. The angular momentum can also be considered a three-dimensional bivector with the components $K_{mn} = R_m P_n - R_n P_m$. The Cartesian matrix of this bivector conforms with $\hat{K} = H_2 H_3 K_{23} + H_3 H_1 K_{31} + H_1 H_2 K_{12}$. This operator is antihermitic and must therefore be multiplied with i. In spherical coordinates

Card 2/3

$$\hat{K} = -\hbar \left\{ \left(\frac{\partial}{\partial \theta} + \frac{1}{2} \text{ctg } \theta\right) H_1 H_3 + \frac{1}{\sin \theta} \frac{\partial}{\partial \varphi} H_2 H_3 \right\} \text{ is}$$

On the Relativistic Momentum and Angular Momentum Operators

SOV/56-37-2-22/56

obtained and this expression appears to be most useful for practical application. The results obtained in this paper also apply in the presence of gravitational fields, if only the frame of reference remains orthogonal, as for example, in the case of the Schwarzschild form. There are 4 Soviet references.

SUBMITTED: March 4, 1959

Card 3/3

S/139/62/000/005/009/015
E032/E314

AUTHOR: Gel'man, A. P.

TITLE: Three-dimensional spinors in quantum mechanics

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
          no. 5, 1962, 128 - 132

TEXT: Although it is generally acknowledged that the electron-
wave function is, in fact, a spinor, nevertheless, in calculating
the angular momentum in curvilinear coordinates, the wave function
is differentiated as if it were a scalar. The spinor nature of the
wave function must be taken into account to obtain a logically
consistent scheme and this is done in the present paper. It is shown
that when this programme is carried out, the spinor nature of the
electron-wave function   leads, on the nonrelativistic approxi-
mation, to results which are usually regarded as essentially rela-
tivistic. For example, the magnetic moment of the electron is
found to have a purely quantum mechanical spinor origin,
independently of whether four- or three-dimensional spinors are
employed. On the other hand, the scalar theory leads to a
correct value for the magneton only in the case of a full relati-
istic treatment. The Dirac equation leads to the correct magneton
Card 1/2

3-dimensional spinors in S/139/62/000/005/009/015
                                  E032/E314

not because it is relativistic but because it is a spinor equation,
although the prediction of the positron and other effects by the
Dirac theory is due to the fact that it is both spinor and
relativistic.

ASSOCIATION: Moskovskiy ordena Lenina khimiko-tekhnologicheskiy
                institut imeni D.I. Mendeleyeva (Moscow Order of
                Lenin Chemicotechnological Institute imeni
                D.I. Mendeleyev)

SUBMITTED: September 28, 1961

Card 2/2

GEL'MAN, A.P.

Three-dimensional spinors in quantum mechanics. Izv. vys.
ucheb. zav.; fiz. no.5:128-132 '62.   (MIRA 15:12).

1. Moskovskiy ordena Lenina khimiko-tekhnologicheskiy
institut imeni D.I. Mendeleyeva.
          (Spinor analysis)   (Quantum theory)

KITAYGORODSKAYA, O.D., professor; KUFER, S.G.; BOSIK, R.N.; GEL'MAN, A.S.;
ROZANOVA, A.M.; KREHDEL', A.S.

Use of diathermia in the compound therapy of pneumonia in children.
Pediatriia 39 no.1:74-75 Ja-F '56.   (MLRA 10:1)
        (PNEUMONIA, ther.
          diathermy, in child.)
        (DIATHERMY, in various dis.
          pneumonia in child.)

ODOSHASHVILI, L.V.; GEL'MAN, A.S.

Physical therapy as an auxiliary therapy method in cataracts in
children. Vop.kur.fizioter. i lech.fiz.kul't. 23 no.2:150-152
Mr-Ap '58.   (MIRA 11:6)

1. Iz glaznogo otdeleniya detskoy gorodskoy klinicheskoy bol'nitsy
No.1 (glavnyy vrach - zasluzhennyy vrach RSFSR Ye.V.Prokhorovich,
zav. otdeleniyem - kandidat meditsinskikh nauk B.A.Tokareva)
          (CATARACT)   (ELECTROPHORESIS)   (DIATHERMY)

CIA 39/49T47

USSR/Engineering
Construction Industry
Construction Equipment

Mar 49

"Mechanizing Transport-Rolling Works at Construction Sites," A. C. Gel'man, Engr, G. V. Komarov, Engr, Promtransproyekt, 4 pp

"Stroi Prom" No 3

In construction and assembly work, loading and operations, and shifting of loads within the construction site are very difficult. There-fore, complete mechanization of a central combined stock pile for large industrial construction and organization of basic routing of construction materials are very important. Refers to a plan (Promtransproyekt), developed at "Avestal" factory for mechanizing various processes, that makes possible a decrease of labor expenditure. Describes characteristics of mechanization plan, with illustrations of transfer cars, stock-pile storage, and various schemes for layouts.

39/49T47

MERKUSHEV, R.N., dotsent, kandidat tekhnicheskikh nauk; BARANOV, I.V., inzhener; KOSTIN, I.I., dotsent, kandidat tekhnicheskikh nauk, redaktor; GEL'MAN, A.S., inzhener, nauchnyy redaktor; BEGAK, B.A., redaktor; PERSON, N.N., tekhnicheskiy redaktor.

[Track and trackless transportation on the building site] Rel'sovyi i bezrel'sovyi transport na stroitel'noi ploshchadke. Pod obshchei red. I.I.Kostina. Moskva, Gos. izd-vo lit-ry po stroitel'stvu i arkhitekture, 1954. 343 p.   (MLRA 7:11)
          (Railroads, Industrial) (Transportation, Automotive)
          (Building)

GEL'MAN, A.S., inzhener; YEFREMENKO, V.P., inzhener; KOMAROV, G.V., inzhener.

Methods for over-all mechanization of aggregate warehouses in concrete and mortar plants used for industrial construction. Stroi.prom. 33 no.9:16-22 S '55.   (MLRA 9:1)
          (Concrete)

GEL'MAN, A...

Technology of contact electric welding Moskva, Gos. nauch.-tekhn. izd-vo mash.-stroit. lit-ry; 1946. 218 p.

Cyr. 4 TK 53

GEL'MAN, A. S.   Dr. Tech. Sci.

Dissertation: Elements of the Theory of Spot Welding." Moscow Order of the Labor
Red Banner Technical School, imeni N. E. Bauman, 10 Nov 47.

SO: Vechernyaya Moskva, Nov, 1947 (Project #17836)

GEL'MAN, A. S. and NIKOLAI, GEORGII ALEKSANDROVICH

Svarnye konstruktsii i soedineniia. Moskva, Mashgiz, 1947.   502 p. diagrs.

Bibliography at end of each chapter.
Welded structures and joints.

DLC: TS227.NC5

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of
Congress, 1953.

GEL'MAN, A.S.

22-618.   Shunting of Current in Spot Welding. A. S. Gelman, *Arfovennoy Delo (Welding)*, no 2, 1947, p 6-10 (In Russian.)

The above phenomenon, which affects the quality of spot welding, was investigated from the theoretical point of view, and verified experimentally. Recommendations for avoidance of shunting.

GEL'MAN, A.S.

B

Static Strength of Spot-Welded Joints. (In Russian)
A. S. Gel'man and I. A. Bakh. Avtogennoe Delo
(Welding), Aug. 1948, p. 6-11.
Investigates the influence of different factors,
such as thickness of joined plates, distribution of
spot-welds, welding conditions, etc., on the above
for a low-carbon steel. Data are charted and tabu-
lated.

METALLURGICAL LITERATURE CLASSIFICATION

GEL'MAN, A. S.

USSR/Engineering
    Welding, Spot
    Steel Welds

Apr 1948

"Spot Welding of 5KhLF Steel," A. S. Gel'man, Candidate Tech Sci; S. S. Astaf'yev, Engr, TsNIITMASh, 9½ pp

"Avtogen Delo" No 4

Use of spot welding on low alloyed steel in building means of transportation led to series of tests on 5KhLF steel. Describes characteristics of subject steel, apparatus and equipment used in the tests, and methods used for the experiments. Discusses results of welding 4-mm plates, and 8-mm plates. Determined that thermal treatment is necessary to insure the quality of spot welds on 4-mm 5KhLF steel.   66T46

GIL'MAN, A. S.; BATS', I. A.

Central Sci. Res. Inst. of Technology and Machine Construction, -cl942-.

Cand. Technical Sci.

"Static strength of multiple-spot welds," Avtogen. Delo, No. 8, 1942

GEL'MAN, A. S.

The Nature of the Thermal Processes and the Dimensions of the Weld Spot in the Welding of Structural Steels. A. S. Gelman. (Avtogennoe Delo, 1948, No. 11, pp. 8-13). [In Russian]. A detailed examination is made of the relationship between the effective area of the spot weld and the thermal effects of the process producing it. Curves of shearing strength against time of welding for two steels are shown. An equation for the temperature distribution is deduced and used for calculating the diameter of the central portion of the spot weld and the depth of fusion, the results being in good agreement with experimental data for spot-welded specimens of low-carbon steel. The effects on extent of fusion of the force applied to the electrodes and of the area of contact are also examined.—J. K.

GEL'MAN, A. S.

Kontaktnaia elektrosvarka. Dop. v kachestve uchebn. posoblia dlia vtuzov.
Moskva, Mashgiz, 1949. 499 p. plates, diagrs.
    Bibliography: p. (494)-496

Electric point welding.

DLC: TK4660.G39

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of
     Congress, 1953.

Automatic Flash Welding of Chromium-Molybdenum Steel Tubes. (In Russian.) A. S. Gel'man and N. S. Kabanov. *Avtogennoe Delo* (Welding). June 1919, p. 8-16.

Describes automatic flash-welding machine for above. Structural details are diagrammed. Optimum conditions of operation, including post heat treatment, are indicated. Data are tabulated and charted.

GEL'MAN, A.S., inzh.; KOMAROV, G.V., inzh.

Mechanization of conveying and unloading construction yards.
Stroi.prom. 27 no.3:20-23 Mr '49.   (MIRA 13:2)

1. Promtransproyekt.
          (Building materials--Transportation)
            (Loading and unloading)

GEL'MAN A. S. (PRO

USSR/Engineering - Welding, Spot
Steel, Welding of

Nov 49

"Spot Welding of SKhL-2 Steel With Electric Heat
Treatment," Prof A. S. Gel'man, Dr Tech Sci,
S. S. Astaf'yev, Cand Tech Sci, Cen Sci Res Inst of
Mach Constr and Metalworking, 6 1/4 pp

"Avtogen Delo" No 11

Examination of welded spots of SKhL-2 steel sub-
sequently subjected to electric heat treatment
showed more than 50% increase in plasticity over
unprocessed spots. Also, hardness was decreased
without lowering strength. Process also recommended
for SKhlF steel and perlite (e.g., Chromansil)

USSR/Engineering - Welding, Spot
(Contd)

Nov 49

steels. Tables show optimum conditions for
heat treatment of various thicknesses of SKhL-2
steel. An apparatus, developed in author's
institute, permits ready automatic control dur-
ing welding and treatment.

153T66

153T66

_____, A. S. and E. SH. SIEFAK

Trekhfaznaia tochechnaia mashina. (Vestn. Mash., 1950, no. 3, p. 48-49)

Three-phase spot welding machine.

DLC: TN4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

USSR/Engineering - Welding, Spot   Apr 50
                        Welding, Equipment

"Spot Welding of Steel Members of Great Thickness
With Low-Frequency Current," Prof A. S. Gel'man,
E. S. Slepak, Engr Cen Sci Res Inst of Heavy
Mach Constr, 6 pp

"Avtogen Delo" No 4

Describes new automatic three-phase spot welding
machine of low frequency designed by Cen Inst.
Equipment permits welding of structural members
up to 12 mm thick, has high efficiency factor
(over 0.9), and reveals low sensitivity to intro-
duction into its circuit of steel members of
great cross section.

                                            158T34

GEL'MAN, A. S. Prof

USSR/Engineering - Welding   Feb 51

"Effect of Magnetic Material in the Welding Machine Circuit on Its Resistance," Prof A. S. Gel'man, Dr Tech Sci, E. S. Slepak, Cand Tech Sci, TsNIITMASh

"Avtogen Delo" No 2, pp 4-6

Theoretical considerations and expts: Total resistance of secondary circuit in resistance welding mach increases with introduction of ferromagnetic material. To maintain steady power conditions secondary voltage of transformer should be increased, whereupon consumption of line power

185T19

USSR/Engineering - Welding (Contd)   Feb 51

increases. Increase in gap between jaws decreases sensitivity of mach to introduction of steel into circuit, since it lowers abs value of mutual induction coeff, which determines effect of steel on induction resistance of circuit.

185T19

185T19

GEL'MAN, A.S. (Prof)

USSR/Engineering - Welding, Processes   Nov 51

"Nature and Role of Fusion Process in Butt Welding," Prof A. S. Gel'man, Dr Tech Sci, TsNIITMASh, K. P. Imshennik, Cand Tech Sci, VNII MSS, N. S. Kabanov, Cand Tech Sci, TsNIITMASh

"Avtogen Delo" No 11, pp 11-15

Discusses results of studying fusion process with rapid motion-picture camera and oscillograph. Establishes formation of molten metal bridges and determines

200T63

USSR/Engineering - Welding, Proc- Nov 51
esses (Contd)

existence time of each bridge as equal to 0.002 sec. Welding zone, as was ob-served, contains considerable amts of CO and CO_2 in atm, which factors, combined with sharp decrease in O content, protect surfaces of molten metal against oxida-tion.

200T63

GEL' MAN, A. S.

PHASE I   TREASURE ISLAND BIBLIOGRAPHICAL REPORT   AID 582 - I

Call No.: AF546656

BOOK
   Author: GEL'MAN, A. S., Dr. of Tech. Sci., Prof.
   Full Title: TECHNOLOGY OF ELECTRIC RESISTANCE WELDING
   Transliterated Title: Tekhnologiya kontaktnoy elektrosvarki
PUBLISHING DATA
   Originating Agency: None
   Publishing House: State Scientific and Technical Publishing House of
      Machine-Building Literature (Mashgiz)   No. of copies: 10,000
   Date: 1952   No. pp.: 324
   Editorial Staff
      Editor: Kabanov, N. S., Kand. of Tech. Sci.
      Appraiser: Sergeyev, N. P., Eng.
PURPOSE: The book is recommended by the Division of Schools of the
   Ministry of Heavy Machine Building of the USSR as a textbook for
   technical schools.

TEXT DATA
   Coverage: This book examines the basic resistance-welding processes
   and contains the essential data on the design and construction of
   standard machines for resistance-welding. The book describes: butt
   welding (including Ignat'yev's method), spot welding, projection and
   T-welding, roll welding. It discusses the electrothermal processes

1/2

Tekhnologiya kontaktnoy elektrosvarki

in resistance welding and the properties and behavior of various metals and alloys during different welding processes. The various machines used for all types of welding methods are described in detail, as well as their installation, adjusting, performance and automatic control. The book deals also with problems of industrial safety, labor organization and Stakhanovite methods (e.g., Eng. Kovalev's method). It contains operation analysis, tables and various other tables, illustrations and diagrams.

No. of References: None

Facilities: Moscow Automobile Plant im. Stalin (ZIS); Gor"kiy Automobile Plant im. Molotov (GAZ); Central Scientific Research Institute of Technology and Machine-Building (TsNIITMASH); A. M. Ignat'yev; N. V. Geveling; G. I. Babat; D. S. Balkovets; K. K. Khrenov; A. A. Sidorenko; K. A. Kochergin; N. Ya. Kochanovskiy; K. P. Imshennik; A. A. Alekseyev; G. A. Nikolayev; G. P. Mikhaylov and others.

GEL'MAN, A. S., HRCF.

USSR/Engineering - Welding, Methods, Equipment   Jan 52

"New Method for Automatic Control of the Butt Fusion Welding Process," Prof A. S. Gel'man, Dr Tech Sci

"Avtogen Delo" No 1, pp 6-10

Describes pneumatic-hydraulic drive developed by TsNIITMASh in 1951. Device may be installed on any nonautomatic butt welding machine with bed sufficiently strong to withstand considerable swaging force developed by drive. Design is

based on assumption that quality of welded joint is detd by extent of its heating, which may be controlled by amt of reduction under given swaging load. Method provides for inspection of welds and rejection of defective joints, smooth regulation of fusing rates and high reduction rate, up to 100 mm/sec.

Source in dossier.

212T12   212T12

GEL'MAN, A. S. PROF

USSR/Engineering - Welding, Methods   Apr 52

"Concerning Utilization of the Impulses of Low-
Frequency Current for Spot Welding of Light Alloys,"
Prof A. S. Gel'man, Dr Tech Sci, TsNIITMASh

"Avtogen Delo" No 4, pp 6, 7

Discusses results of testing joints made by spot
welding of duralumin 4 and 5 mm thick. Concludes
that low-frequency machines are adaptable for spot
welding of light alloys and suggests further sys-
tematic investigation to this effect.

212T30

GEL'MAN, A.S., doktor tekhnicheskikh nauk, professor.

Efficient technology of resistance flash welding of steel. [Trudy] TSNIITMASH 60:104-173 '53.

(MLRA 6:11)

(Electric welding)

GEL'MAN, A. S.

USSR/Engineering

Card 1/1   Pub. 128 - 18/32

Authors   : Gel'man, A. S., and Karpov, V. F.

Title   : The production of welded cast-structures

Periodical   : Vest. mash. 11, 62-66, Nov 1954

Abstract   : A description is presented of methods employed by the Stalin Machine Con-
struction Factory in Khramatorsk, in producing welded cast-structures (hydro-
turbine stators). The overall production of components in 1953, by the a-
bove mentioned factory, constituted   5,462 tons. Drawings; tables; dia-
grams; illustrations.

Institution   : ...

Submitted   : ...

Gel'man A.S.

J

POLAND/Acoustics.

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10204

Author : Gel'man, A.S., Kabanov, N.S., Matveyev, A.S.
Inst   : Not given
Title   : Ultrasonic Control of Joints Made by Spot Welding.

Orig Pub: Zavod. Laboratoriya, 1954, 20, x15, 562-567

Abstract: No abstract.

Card   : 1/1

GEL'MAN, A.S.

USSR/Engineering—Flash welding

Card 1/1   : Pub. 128—22/33

Authors   : Gel'man, A. S., Dr. Tech. Sci., Prof.

Title   : Flash welding with the use of high-frequency current and artificial
             protection from oxidation

Periodical : Vest. mash. 34/8, 74-77, Aug 1954

Abstract   : A comparison is presented between the use of 50-cycle and 2,500-cycle
             current in flash welding. It is found that with the higher frequency
             the temperature at 20 to 25 mm distance from the butts is 400 to 500°
             instead of 100° as with the lower frequency. An analysis of the
             results shows the higher frequency to be better for work such as the
             welding of tubes. An explanation is given of the method of protecting
             against oxidation. Two Russian references: (1951 and 1952).
             Illustrations; tables; graphs.

Institution : ....

Submitted   : ....

BLITSHTEYN, A.Z.; GEL'MAN, A.S., doktor tekhnicheskikh nauk, professor,
retsenzent; PASTERNAK, V.A., inzhener, redaktor; MODEL', B.I.
tekhnicheskiy redaktor.

[Electric plug welding] Svarka elektrozaklepkami. Moskva, Gos.
nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1955. 110 p.
        (Electric welding)   (MLRA 8:12)

112-1-1043

Translation from: Referativnyy Zhurnal, Elektrotekhnika, p.166,
Nr 1, 1957, (USSR)

AUTHORS: Gel'man, A.S., Tokarskiy, A.P., Komissarov, S.N., and
Slepak, E.S.

TITLE: Resistance Butt Welding of Stainless Steel Bands
(Kontaktnaya stykovaya svarka polos iz nerzhaveyushchey
stali)

PERIODICAL: Sbornik:Vopr. svarki v energomashinostroyenii i metal-
lurgich. proizv-ve, Moscow, Mashgiz, 1955, pp. 120-155.

ABSTRACT: Production methods and machines of the ЦКБММ   -24
and   ЦКБММ-12 types were developed for butt welding
by flashing off bands from carbon and stainless steels
3 to 4 mm thick and 400 to 450 mm wide. The   ЦКБММ-24
machine has the same electric circuit as the   ЦКБММ-12

Card 1/3   and differs from it by a more improved gripping mechanism

Resistance Butt Welding of Stainless Steel Bands (Cont.) ·

developing a greater fastening force (100 tons), by a
greater stiffness of the stand at the expense of anchor
ties, by a greater capacity of the setting motor (16 kw)
and by a correspondingly greater force of this setting
(27 tons). The electric system of the   ЦКБММ -24
machine consists of three basic circuits: a power supply
circuit of the welding 200-kva transformer with a
sectional switch and main contacts of the magnetic con-
troller, a circuit of the MT-42-8 type motor, and a con-
trol circuit. Laboratory investigations and industrial
practice in butt welding of bands demonstrated the ex-
pediency of a transition from band welding with preheating
to continuous flash welding, and in addition to that, a
very uniform heating of the welded rims is provided, de-
pending lightly on the network voltage and on the accuracy
of putting the butts together before welding. The use of
machines with a sloping external characteristic gives an,
even surface of the flashed off faces with reduced require-
ments for the perpendicularity of the bands' cut. The
Card 2/3   magnitude of the angle of bend of the band which would not

112-1-1043

Resistance Butt Welding of Stainless Steel Bands (Cont.)

bring about cracks in the seam constitutes a criterion
for the evaluation of the quality of the weld from the
point of view of a possibility of subsequent cold rolling
of the welded band. The machines for butt welding ought
to have considerable rigidity, indispensable for obtaining
the required high speed of settling and for the prevention
of a possibility of displacement of the rims of the
welded sheets.

B.S.

Card 3/3

GEL'MAN, A.S., doktor tekhnicheskikh nauk, professor.

      Butt welding of tool steel strips. Svar.proizv. no.1:4-7 Ja '55.

                                    (MLRA 9:4)

      1.Tsentral'nyy nauchno-issledovatel'skiy institut tyazhelogo
mashinostroyeniya.

                 (Tool steel--Welding)

Gel'man,   A.S.

USSR.

8519.   Stability of the Micro-Structure and Properties of Butt
Joints of Austenitic Steel With Pearlitic Steel. O stabil'nosti
struktury i svoistv stykovykh soedinenii austenitnoi stali s
perlitnoi.   (Russian.)   A. S. Gel'man and V. S. Pozn.
Svarochnoe Proizvodstvo, 1957, No. 2, Feb., p. 7-10.
Influence of composition and heat treatment of 20 austenitic
and pearlitic high-alloy steels to determine optimum conditions
for joining. Tables, diagrams, micrographs.

Central Sci Res Inst Technology + Machine Construction

GEL'MAN, A.S., professor, doktor tekhnicheskikh nauk; KOMISSAROV, S.N., inzhener; SLEPAK, E.S., kandidat tekhnicheskikh nauk.

Resistance butt-welding techniques of thin steel strips. Svar. proizv. no.4:17-22 Ap '55.   (MLRA 8:9)
        (Steel--Welding)

Gel'man, A.S.

Method of Determining Residual Stresses in Butt Joints or Tubes of Steels with Different Coefficients of Thermal Expansion. A. S. Gel'man and V. S. Popov. Zavodskaya Laboratoriya 1955, 21, 99-104

... example a butt ... ... austenitic steel a method ... ... this type of welding ...

steel tubes are presented. The method is restricted to thin-walled tubes—e.g.

GEL'MAN, A.S., dokter tekhnicheskikh nauk, professer; SLEPAK, B.S., kandidat tekhnicheskikh nauk.

Butt welding of boiler tubes made of austenite steel. Trudy TSNIITMASH 76:3-22 '55.   (Pipe, Steel--Welding)   (MLRA 9:7)

GEL'MAN, A.S., dokter tekhnicheskikh nauk, professor; POPOV, V.S., kandidat
tekhnicheskikh nauk.

Investigating the flash butt welding of austenite steel pipe and
perlite steel pipes. Trudy TSNIITMASH 76:43-78 '55. (MLRA 9:7)
(Pipe, Steel--Welding)

137-58-3-5335

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 124 (USSR)

AUTHOR: Gel'man, A.S.

TITLE: Principal Conditions for High-grade Flash Welding of Steel
(Osnovnyye usloviya kachestvennoy svarki stali oplavleniyem)

PERIODICAL: V sb.: Probl. dugovoy i kontakt. elektrosvarki. Kiyev-
Moscow, Mashgiz, 1956, pp 217-233

ABSTRACT: An examination of butt-welding investigations performed at
the TsNIITMASh over a period of years. Possible reasons for
the occurrence of defects were analyzed, also the conditions
necessary for the achievement of high-quality joints in flash
welding of low carbon and low alloy steels. The following de-
ductions were made: 1) thermal processes play an important
role in flash welding; they influence the precipitation proces-
ses in the weld and thus determine whether or not perfect
welds with high mechanical properties can be obtained; 2) at
the last stages of flashing off and at the beginning of precipi-
tation, the metal on the edges of the joint must be maintained
in liquid state; plastic deformation must be sufficiently high
to remove all molten metal as well as oxides from the gap

Card 1/2

137-58-3-5335

Principal Conditions for High-grade Flash Welding of Steel

between the two faces; 3) components must be uniformly heated throughout their cross section, and their longitudinal temperature fields must be ident-ical. This is most easily accomplished in continuous flash welding, which proceeds uniformly throughout the cross section of the components being welded; 4) flash welding must be stable, intense, sufficiently rapid, and should have no significant interruptions in the flow of current.

V.Ts.

Card 2/2

PERIODICAL ABSTRACTS

Sub.: USSR/Engineering   AID 4180 - P

GEL'MAN, A. S.
STYKOVAYA SVARKA LENTY IZ INSTRUMENTAL'NYKH STALEY (Butt-welding of Flat Tool-steel). Svarochnoye proizvodstvo, no. 1, Ja 1956: 4-7.

Experiments for development of continous flash welding of band-shaped carbon steels carried out at the Central Scientific Research Institute of Machine-Building Technology (TsNIITMASh) are described in this article. The welding of tool-steel and spring steel so that the welded strips can withstand subsequent cold rolling without forming cracks, fissures or ruptures was the problem. According to the author the successful results of these experiments are now in practice at the Steel Rolling Mill im. Molotov. Six tables, 8 drawings, graphs and microphotographs.

AID P - 5055

Subject   : USSR/Engineering-Welding

Card 1/1   Pub. 107-a - 4/9

Author   : Gel'man, A. S., Dr. of Tech. Sci. Prof. (TsNIITMASh)

Title   : Elimination of oxide occlusions in the joint during resistance flash welding.

Periodical   : Svar. proizv., 5, 17-19, My 1956

Abstract   : The author describes the metallurgical analysis of the resistance flash welding process with a view to the elimination of the oxide occlusions in order to ensure strong and plastic joints. He indicates certain conditions expressed in mathematical formulae, graphically illustrates his observations, and makes a few relevant suggestions. Five formulae, 3 diagrams, 1 drawing and 1 photo. Three Russian references (1953-55).

Institution   : Central Scientific Research Institute of Machine Building Technology (TsNIITMASh)

Submitted   : No date

1676* (Russian.) Contact Welding of Piping for Boilers of Especially High Characteristics. Kontaktnaia svarka trubnoi chasti kotlov sverkhvysokikh parametrov. A. S. Gel'man and E. S. Slepak. Metallovedenie i Obrabotka Metallov, 1956, no. 9, Sept. 1956, p. 41-49.

Data on welding for superhigh-pressure boilers. Welding of pipes of austenitic steel and of pipes of austenitic steel to those of pearlitic steel is discussed.